Amendments to Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-16 (cancelled).

Claim 17 (new): An image processing method for recovery of a scene structure from successive image data, the method comprising the steps of:

(a) computing rotational motion in the successive image data using a combination of first rotational flow vectors derived from a set of tracked points collected from the successive image data and second rotational flow vectors derived from a set of tracked lines collected from the successive image data;

(b) constructing a shift data matrix for the tracked lines and the tracked points that compensates for the rotational motion in the successive image data; and

(c) decomposing the shift data matrix into a translational motion matrix and a structure matrix and recovering the scene structure by solving for the structure matrix.

Claim 18 (new): The image processing method of claim 17 wherein the second rotational flow vectors derived from the set of tracked lines is represented by projections in two directions that take into account differences in noise of a measured line in different directions.

Claim 19 (new): The image processing method of claim 18 wherein the first rotational flow vectors are represented by

$$\Psi_x \equiv \begin{bmatrix} \{r_x^{(1)}(q)\} \\ \{r_y^{(1)}(q)\} \end{bmatrix}, \Psi_y \equiv \begin{bmatrix} \{r_x^{(2)}(q)\} \\ \{r_y^{(2)}(q)\} \end{bmatrix}, \Psi_z \equiv \begin{bmatrix} \{r_x^{(3)}(q)\} \\ \{r_y^{(3)}(q)\} \end{bmatrix}$$

and where the second rotational flow vectors are represented by

$$\Psi_{Lx} \equiv \begin{bmatrix} \{P_U \cdot (\hat{x} \times A)\} \\ \{P_L \cdot (\hat{x} \times A)\} \end{bmatrix}, \Psi_{Ly} \equiv \begin{bmatrix} \{P_U \cdot (\hat{y} \times A)\} \\ \{P_L \cdot (\hat{y} \times A)\} \end{bmatrix}, \Psi_{Lz} \equiv \begin{bmatrix} \{P_U \cdot (\hat{z} \times A)\} \\ \{P_L \cdot (\hat{z} \times A)\} \end{bmatrix}$$

where P_U and P_L represent unit vectors projecting on the two directions.

Claim 20 (new): The image processing method of claim 17 wherein the rotation motion is compensated through linear elimination of rotational dependence in the shift data matrix.

Claim 21 (new): The image processing method of claim 17 wherein the shift data matrix is decomposed using singular value decomposition.

Claim 22 (new): The image processing method of claim 17 wherein components of the shift data matrix are weighted to account for greater accuracy of measurement of the components.

Claim 23 (new): The image processing method of claim 17 wherein the method is iterated until it converges to a reconstruction of the scene structure.

Claim 24 (new): An image processing method for recovery of a scene structure from successive image data, the method comprising the steps of:

(a) computing planar homographies between the successive image data using tracked points and tracked lines collected from the successive image data where sequences in the successive image data are uncalibrated;

(c) constructing a shift data matrix for the tracked points and the tracked lines that compensates for the planar homographies;

(d) decomposing the shift data matrix into a translational motion matrix and a structure matrix; and recovering the scene structure by solving for the structure matrix.

Claim 25 (new): The image processing method of claim 24 wherein the shift data matrix is decomposed using singular value decomposition.

Claim 26 (new): The image processing method of claim 24 wherein the method is iterated until it converges to a reconstruction of the scene structure.

Claim 27 (new): An image processing method for recovery of a scene structure from successive image data, the method comprising the steps of:

(a) parameterizing a set of tracked lines collected from the successive image data;

(b) computing rotational motion in the successive image data using rotational flow vectors derived from the tracked lines where the rotational flow vectors are represented by projections in two directions that take into account differences in noise of a measured line in different directions;

(c) constructing a shift data matrix for the tracked lines that compensates for the rotational motion in the successive image data; and

(d) decomposing the shift data matrix into a translational motion matrix and a structure matrix and recovering the scene structure by solving for the structure matrix.

Claim 28 (new): The image processing method of claim 27 wherein the rotational flow vectors are represented by

$$\Psi_{Lx} \equiv \begin{bmatrix} \{P_U \cdot (\hat{x} \times A)\} \\ \{P_L \cdot (\hat{x} \times A)\} \end{bmatrix}, \Psi_{Ly} \equiv \begin{bmatrix} \{P_U \cdot (\hat{y} \times A)\} \\ \{P_L \cdot (\hat{y} \times A)\} \end{bmatrix}, \Psi_{Lz} \equiv \begin{bmatrix} \{P_U \cdot (\hat{z} \times A)\} \\ \{P_L \cdot (\hat{z} \times A)\} \end{bmatrix}$$

where P_U and P_L represent unit vectors projecting on the two directions.

Claim 29 (new): The image processing method of claim 27 wherein the rotation motion is compensated through linear elimination of rotational dependence in the shift data matrix.

Claim 30 (new): The image processing method of claim 27 wherein the shift data matrix is decomposed using singular value decomposition.

Claim 31 (new): The image processing method of claim 27 wherein components of the shift data matrix are weighted to account for greater accuracy of measurement of the components.

Claim 32 (new): The image processing method of claim 27 wherein the method is iterated until it converges to a reconstruction of the scene structure.